

REMARKS

The Examiner objected to "[t]he symbols in the upper right hand corners of the 'X' in the structures 'I' and possibly 'III' of claims 1, 9, 21 and 22." The Examiner noted that these symbols "appear[] to be a dot, rather than a negative charge (-) as is clearly required while the style of the X's in the structure and the rest of the independent claims differ." Applicants believe they have adequately addressed these concerns by enlarging the display of the formulas in the above listing. Since all that has been done by this listing is enlarging these displays, Applicants have taken the position for purposes of compliance with 37 C. F. R. § 1.121(c) that these claims have not been further amended from the last time they were presented solely by reason of this enlargement of the displays.

The Examiner rejected claims 2, 3, 4 and 19-22 under 35 U. S. C. § 112, second paragraph. The Examiner takes the position that the term "molar mass" is unclear, arguing that "molar masses in macromolecular materials exist as a distribution which varies depending on the type of distribution i. e. weight or number average molecular weight and as the type of distribution is not stated at least claim 2 is unclear." The Examiner further takes the position, Applicants believe as to claims 4 and 20, that "[v]iscosities vary depending on solvent and concentration and since [A]pplicants['] claims reciting viscosities do not recite such they are unclear." The Examiner further takes the position as to claims 21 and 22 that "[c]laim 21 is unclear in that the preamble recites a method of making a coagulating or flocculating agent but otherwise recites no actual process steps of making the agent and it is therefore unclear what process steps are encompassed. Claim 22 similarly recites no actual process steps pertinent to the process in the preamble."

As to claim 2, it has been cancelled without prejudice by this amendment. As to claim 2 then, the 35 U. S. C. § 112, second paragraph rejection is moot. As to claims 4 and 21, amendments have been made to these claims to overcome the perceived indefiniteness. As to claims 21 and 22, each of these claims now recites a two step process, namely, "providing water soluble branched block copolymers that consist of polymeric backbone chains of quaternary ammonium units of general formula I * * * mutually linked together by poly(alkylene glycol) blocks, which consist of units of general formula II * * * replacing individual units of general formula I." Applicants submit that these claims now do clearly recite "[a] method of making at least one of a coagulating agent and a flocculating agent for the separation of suspended solids," in the case of claim 21, and "[a] method for at least one of the manufacture of paper, the treatment of waste water, and the removal of water from sludge," in the case of claim 22. Applicants submit that the amendments made to claims 21

and 22 by this amendment thus overcome the 35 U. S. C. § 112, second paragraph rejection of these claims as well.

The Examiner rejected claims 1-16 and 19-22 under 35 U. S. C. § 103. The Examiner relied upon the combination of Neff U. S. Patent 5,882,525 (hereinafter Neff), Bhattacharyya U. S. Patent 4,713,431 (hereinafter Bhattacharyya) and page 1, lines 29-33 of the present application. The Examiner takes the position that

“Patentees disclose a polymer which may contain [A]pplicants['] monomers ‘I’ at column 4, lines 47-58 and 4-80 parts per million of a ‘branching agent’ [calling Applicants’ attention to the paragraph bridging columns 3 and 4 of Neff] such as PEGDMA of molecular weight of 600 [calling Applicants’ attention to experiments 10 and 11 in column 9 of Neff]. The materials may be used as flocculants [and] agents for effluent in the treatment of sludges [calling Applicants’ attention to Neff, column 1, lines 10-39].”

The Examiner concedes that

“[t]here are no examples of a material produced by using patentees['] diallyl ammonium compounds in combination with [A]pplicants['] amounts of PEG dimethacrylate although patentees disclose that [A]pplicants['] amounts of branching agent which include PEGDMA may be used in amounts encompassing [A]pplicants’ in combination with monomers including [A]pplicants[']. Hence it would have been obvious to a practitioner having an ordinary skill in the art at the time of the invention to select [A]pplicants['] components in [A]pplicants['] amounts from the disclosure of the patent in the expectation of adequate results absent any showing of surprising or unexpected results.”

The Examiner continues:

“Patentees do not appear to disclose inverse emulsion polymerization as required by certain dependent claims. However, page 1, lines 29-33 of [A]pplicants['] specification discloses that the advantage of inverse emulsion polymerization is known in the art for increasing molecular weights of flocculating polymers. Hence use of inverse emulsion polymerization would have been obvious to a practitioner having an ordinary skill in the art at the time of the invention to confer the advantage of increased molecular weight absent any showing of surprising or unexpected results.”

The claims have now been amended to recite: “[w]ater soluble branched block copolymers * * * [that] consist of polymeric backbone chains of quaternary ammonium units of general formula I * * * mutually linked together by poly(alkylene glycol) blocks, which consist of units of general formula II * * * replacing individual units of general

formula I” (claim 1); “preparation of water soluble branched block copolymers consisting of the [free] radical polymerization of a quaternary diallylammonium compound of general formula III * * * and bis-acrylate esters or bis-methacrylate esters of poly(alkylene glycols) of general formula IV * * * [with] the proportion by mass of the compound of general formula IV amounting to between 0.01 and 20 % by weight based on the two starting compounds” (claim 9); and, “providing water soluble branched block copolymers that consist of polymeric backbone chains of quaternary ammonium units of general formula I * * * mutually linked together by poly(alkylene glycol) blocks, which consist of units of general formula II * * * replacing individual units of general formula I” (claims 21 and 22). These claims thus all adopt “consisting of” terminology.

The cited references teach away from such combinations. Neff characterizes it as crucial that a chain-transfer-agent be added when the copolymers are produced (Neff, col. 5, l. 34). These chain-transfer-agents are thus also present in the resulting copolymer as co-monomer. Furthermore Neff’s examples always disclose the mixture of not just one, but two branching agents (see Neff’s table 1: 60/40-mixture of AMD and Q9), which further differentiates the claims as amended from Neff. Neff teaches that Neff’s invention will not work in absence of the chain-transfer-agent (see Neff, col. 5, l. 37). Contrary to the teachings of Neff, excellent yields as well as good water-soluble copolymers which favorably can be used as flocculation agents and coagulation agents can be obtained by the compositions of the present claims, despite the fact that no chain-transfer-agents are used in the compositions of the present claims.

Therefore, the present claims provide copolymers with simpler structures. The copolymers of the present claims eliminate at least one of Neff’s compounds. Cost can be reduced. Hazardous chemicals, such as Neff’s described alcohols, acids, phosphates, and the like, can be avoided.

Accordingly, Applicants submit that the claims, as amended, patentably distinguish over the art of record, and respectfully request further favorable action, culminating in allowance.

The Commissioner is hereby authorized to charge any fees which may be necessary to constitute this a timely response to the March 24, 2008 official action, to our undersigned counsel's deposit account 10-0435, with reference to file number 127-75824.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Richard D. Conard', written in a cursive style.

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